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HUDSON
SPECIALTY FOODS

DATE: 12-30-96

TO: David Howard

FROM: Rick Bohanek

NUMBER OF PAGES INCLUDING THE COVER PAGE 5

OUR FAX NUMBER IS (417) 837-1616. IF YOU HAVE ANY PROBLEMS RECEIVING THIS FAX, PLEASE CALL OUR OFFICE AT (417) 862-3612.

SPECIAL INSTRUCTIONS: FYI

SIGNED: Rick Bohanek

Hudson Foods, Inc. • 405 N. Jefferson • P.O. Box 50190 • Springfield, MO 65805 • (417) 862-3612

UNITED STATES DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE
WASHINGTON, DC

FSIS DIRECTIVE	7110.4	8-8-95

LIQUID SMOKE REUSE

I. PURPOSE

This directive provides guidelines for reuse of liquid smoke solutions.

II. (RESERVED)

III. (RESERVED)

IV. REFERENCES

FSIS Directive 11,220.1, dated 6/31/97.
FSIS Directive 8820.1, dated 9/21/88.

V. ABBREVIATIONS

The following will appear in their shortened form in this directive:

IIC	Inspector in Charge
ISG	Inspection System Guide
MPI	Meat and Poultry Inspection

VI. POLICY

A. FSIS receives numerous requests to allow for the extended use of pickle, brine, and other solutions. Often the original request stems from the costs and regulatory requirements associated with disposal into a municipal sewage system. FSIS has determined that if the solution can be adequately treated, filtered, and stored without creating sanitary problems or adulteration, then provisions may be made for extended product use. This directive sets forth the guidelines for extended use of liquid smoke that has been used in drench- or deluge-type cabinets only for up to 7 calendar days.

DISTRIBUTION: Inspection Offices; T/A Inspectors; Plant Mgt; T/A Plant Mgt; TRA; ABB; PRD, Import Offices

OPI: S&T/PPID

B. Liquid smoke may be used on uncooked products only if they are to be fully cooked immediately following treatment. The smoke should not be reused as an ingredient in the formulation of any product; it should be used only in drench or showering operations. The equipment, piping, and filtering system must be USDA approved and installed in accordance with FSIS Directive 11,220.1. The storage containers should be constructed from stainless steel or another approved material suitable for the purpose and capable of being enclosed.

C. To ensure that the reused liquid smoke is maintained in a sanitary condition, establishments must develop written procedures to prevent contamination of smoked products that cover the storage, testing, and use parameters outlined in Paragraph VII.

D. pH is a measure of the degree of ionized acidity in a solution. Technically, pH is the negative logarithm of the concentrated acid (specifically the concentration of hydronium ion [H_3O^+]) in a solution. pH is measured directly by its effect upon colored pigments (pH paper) or by its effect upon an electronic device called a pH meter. It is reported on a scale ranging from 1 to 14, with 7 being the concentration of hydrogen ions in an exactly neutral water solution. Acid solutions are water solutions with a pH below 7. Solutions with a pH above 7 are considered to be alkaline. Since most food has a pH between 5.6 - 6.5, a food is often called acid only if it has a pH below this range.

E. Titratable acidity is the total amount of both ionized and un-ionized acid that is present in a solution. It is expressed as percent concentration of acid. As the sum of both ionized and un-ionized acidity, titratable acidity is different from pH, which is only ionized acidity. The total of ionized and un-ionized acid is termed titratable acidity because it is measured with an acid-base titration. An acid-base titration is an operation in which alkali is added in measured amounts until it exactly neutralizes all of the acid. The point of neutralization is determined with a pH meter and the amount of alkali added is exactly equal to the total amount of both the ionized and un-ionized acid present because the added alkali neutralizes all of the ionized acidity in the solution. As the ionized acid is neutralized, the un-ionized acid becomes ionized to replace it. Eventually, the addition of alkali causes all of the acid to become ionized and then neutralized, so that the total amount of acid present is measured.

VII. **PROCEDURES.** The following should be included in the written procedure addressing the reuse of liquid smoke:

A. The smoke solution should be maintained at pH 4.0 or less and have a minimum titratable acidity of 1.0 percent.

B. The pH and titratable acidity should be measured and recorded at least once a day before operations begin and prior to adding additional smoke concentrate.

C. The smoke solution should be maintained free of visible fat and other particulate matter by continuous filtration during use.

D. Extended use smoke solution may only be applied to products which will be heated to temperatures and for times that are in accordance with those set forth in the MPI Regulations, Sections 318.17, 318.23, and 381.150.

E. Smoke solutions should be discarded if any of the following conditions occur:

1. The solution pH tests at greater than pH 4.0.

2. The titratable acidity tests at less than 1.0%.

3. The solution or any part thereof has been in use for more than 7 calender days.

4. The solution has an off odor or appearance.

5. The smoke solution has contacted contaminated equipment surfaces, including filters, storage containers, or the cabinet reservoir.

F. Establishments should develop a set of instructions for controlling smoke solution reuse and distribute to the appropriate establishment employees for implementation. These instructions should include:

1. How to monitor solution age, pH, titratable acidity, and appearance.

2. How often the solution will be replenished.

3. When to discard the solution.

4. Which products may receive reused smoke solution.

5. Cleaning instructions and frequency for the system equipment, including the filters.

G. Completed test reports are to be kept on file in the establishment for a period of 1 year and made available for the FSIS inspector's review.

IX. INSPECTOR RESPONSIBILITIES

The inspector shall monitor establishment compliance using the ISG inspection tasks 01C09a1 and 01C09a2. Corrective and preventive actions are to be taken by the establishment when necessary. The inspector shall take actions as specified in FSIS Directive 8820.1 if the inspector finds deficiencies with the liquid smoke reuse program.

Deputy Administrator
Inspection Operations

UNITHERM FOOD SYSTEMS INC
1108 WEST HARTFORD
PONCA CITY, OKLAHOMA 74601
TELEPHONE: 405-762-0197
FAX: 405-762-0199

A WORLD OF STAINLESS STEEL PRO

December 31, 1996

Mr. John Reicks
Mr. Frank Mello
BRYAN FOODS
1 Churchill Road
P. O. Box 1177
West Point, MS 39773

Via Fax # 601-495-4504

RE: Quote #407DH

Dear Sirs:

The following is a full quotation for the processing line on which we have been working.

We have been smoking two products for BRYAN FOODS. The current process involves:

1) De-bagging
2) Purge removal
3) Dipping / Drenching in liquid smoke
4) Heat treating in the RapidFlow for 10 minutes
5) Chilling for 15 minutes in an impingement chiller

1) DE-BAGGING

We have developed a machine that washes the surface of the bag, inflates the bag, and cuts the bag open. The bag is then manually removed.

Price F.O.B Ponca City, Oklahoma: $ 25,000

2) PURGE REMOVAL

It is necessary to remove the purge from the surface of the product. We are flashing the product through the oven to do this today, however, we have a small infra-red grill that would accomplish this.

Price F.O.B Ponca City, Oklahoma: $ 18,000

3) SMOKE / LIQUID APPLICATOR

This would be designed to re-circulate the liquid in a partial dip tank. There would be an automatic self-leveling infeed from a header tank to assure a minimum of by-product The process would filter out particulate

Detail drawings would be supplied for approval

Price Ex Works Ponca City, Oklahoma $ 25,000

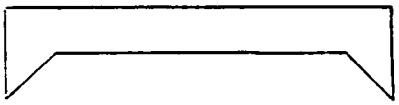
4) UNITHERM RAPIDFLOW CONTINUOUS CONVECTION OVEN

Product A - 7-lb. Ham

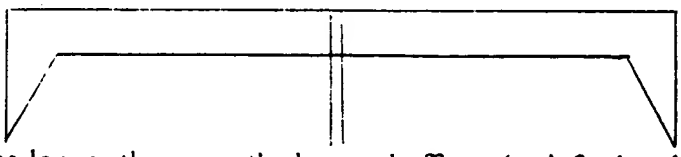
Product Size:	7" x 8"
Belt Width:	40"
Belt Length:	17'
Dwell Time	8 - 10 minutes
Throughput:	5 units across 24 linear = 120

Therefore, based on slowest time, 720 units per hour or 5,040 lbs per hour.

The heat profile in a 1-zone oven is:



The heat profile in a 2-zone oven is as follows:



What this means is that the longer the oven, the less end effects (or infeed and discharge) atmosphere The result is typically a faster process In my experience, you should see at least one minute being shaved off the process For example, the product shown on the video is smoked in a 3-zone oven for 7½ minutes

A 9-minute dwell time would give you a throughput of 5,544 lbs

Product B - 9½-lb. Ham

Product Size 7½" x 11"

Belt Width:	40"
Belt Length:	17'
Dwell Time:	10 minutes
Throughput:	5 across and 18 linear (See notes)

This is 540 units per hour or 5,140 lbs per hour. If, as we expect, the dwell time is reduced to 9 minutes, then the throughput would be 5,643 lbs per hour.

Notes:

The darker parts on the ham are where the fat is more apparent on the surface.

Given that your desired product throughput is 5,000 lbs per hour, I would recommend a 2-zone oven. This does not allow you any room for expansion and is dependent on achieving the correct belt loading. However, since the oven is modular, a third zone could be added at a later date. The same can be said for the Impingement Chiller. If you do intend to extend, you will need to consider this when selecting the oven site.

Running Costs in Dollars:

The total load is 192kW. Therefore, assuming a purchase price of $.03 per kilowatt hour at BRYAN FOODS, the cost at start-up each day would be $5.76 per hour. The current is controlled by thyristors. This modulates the total load so that the elements do not run flat out or in an on / off scenario.

A comparison would be with a car accelerator. If the desired speed is 50 MPH, you accelerate aggressively at start-up, then, upon arrival, you back off the accelerator, holding it steady. If you come to a hill, you can increase the power. The thyristor does the same with the oven so that your running cost will average out at about 40 - 50 percent of the total load. Life expectancy of the elements is greatly enhanced and costs reduced.

This is partially what makes the oven unique. It is also why we can control the oven temperature to plus or minus one degree.

Process Parameters

Product:	Ham
Initial Temperature:	40° C.
Cook / Brown Temperature:	350° C.
Residence Time:	7½ to 10 minutes
Steam Injection:	2 Bar (not required for browning)

UNITHERM RAPIDFLOW II CONTINUOUS CONVECTION OVEN RF2

Belt Height:	40"
Belt Width	40"
Belt Type:	Flat flex wire belt
Overall Length:	20'
Cooking Length:	17'
Drive Motors:	1 off, SEW geared motor. IP 55 (1.3kW)
Belt Speed:	2 minute minimum; 4 hour maximum
Circulation Fans:	6 off, stainless steel impeller (6 x 0.75 kW) Balanced by UNITHERM to provide even heat across entire belt width.
Steam Injection System:	Into cooking chamber. Nominally 80 kgs per hour maximum at 2 bar dry saturated. (Independently controllable.)
Extraction Fan:	2 off, Bifurcated 2000 cfm variable (0.75kW). Stainless steel construction.
Belt Washer (Continuous):	High pressure (25 bar) pump. Adjustable weir plate within washer to regulate water usage / effluent discharge. Pump close-coupled to 15 kW drive motor.
Heating System:	Comprised of 48 x 2 kW finned incalloy elements per zone. Elements designed to maximize efficient heat transfer (192 kW total heating load). Elements controlled via electronic thyristor drive to maximize energy efficiency. To maximize start-up time, full energy usage allows the oven to reach maximum temperature (350°C) within 15 minutes from cold. PID temperature controllers within each zone allow accurate set point control of +/- 1°C.

Fire Protection Systems:	Operated by a solid-state, approved fire detector. Twin systems, steam at nominally 6 bar to flood the lower chamber and cooking area. Mains water into the oven top canopy. Pressure switches ensure pressure available to allow machine to operate.
General Construction:	All AISI 304 stainless steel. Main framework constructed from 40 x 40 RHS. Inner chamber allowed to "Free Float" for expansion purposes. Height adjustable, self-leveling feet fitted. Outer canopies hinged to allow cleaning. During hygiene, all belt support rods are easily removed and refitted. Fat collection tray in lower cooker chamber with 3"-diameter outfeed pipe to drain / collection system. Baffle plates on circulation fans are removable for hygiene. All pipework has de-mountable fitting to allow hygiene.
Control Panel:	Stainless steel IP 65, clear macrolon cover over door furniture and controllers. Visual display of temperature in each zone. Visual display of belt speed (frequency). General control gear telemecanique.

All Up Power Requirements:

Heating System:	192 kW
Circulation Fans:	4.5 kW
Extraction Fans:	3 kW
Belt Washer:	15 kW
Controls, etc.	2 kW
Drive Motors:	2 kW
Total:	218.5 kW

Costs of maintenance are minimal. A weekly check of all components will take one hour, due to the "Maintenance Friendly" design of the machine

UNITHERM RapidFlow II RF-2 - 2-Zone		
Price F.O.B. Ponca City, Oklahoma		$ 325,000
Installation - 2 engineers, 2 days		$ 3,800
Delivery Charge	Budget	$ 2,400

Commercial Notes

Installation includes the following:

Mechanical erection and leveling
Electrical interconnection using stainless steel and flexible conduit
Functional testing of all systems
Fire suppression system testing

Exclusions

Civil engineering work
Ducting from top of extract fans through roof space
Service connections (mains, incomer, steam, water, drains)

Commissioning

Commissioning will commence upon completion of installation.
Commissioning is charged at $50 per hour for all hours worked, including traveling.
Out-of-pocket expenses and hotels will be charged at cost, or if preferred, settled directly by the client.
Signed timesheets to be submitted for approval; these form the basis of invoices.

Documentation

Machine will be supplied with one full instruction manual including electrical drawings

Spares

A comprehensive spares listing with recommended stock holding will be supplied after order placement.

5) UNITHERM LINEAR IMPINGEMENT CHILLER

Product Type:	Hams
Specific Heat Capacity:	3.95 k 5/kgk
Entry Temperature:	185° F.
Exit Temperature:	40° F.
Throughput:	600 lbs cooked weight per hour

Machine Specification

Features

Stainless Steel Evaporator Coils
Heavy Duty 6"-Insulated Food-Safe Encasement
Heavy Duty Stainless Steel Flooring with 6" Insulation
Twin Access Doors with Heated Seal Arrangement
Variable Residence Time
High Airflow "Tuned" to Product Requirements
Stainless Steel Product-Conveyor Belt
Stainless Steel Control Panel
Defrosting Control Circuits

Encasement

Footprint	30' Overall Length
	10' Overall Width
	12' Maximum Height

Utilizing 6"-Thick, Food-Safe Polyurethane-Insulated Panels
Stainless Steel Cladding on Floor, Falling to a Drainage Outlet
Twin Access Doors with Heated Seal Arrangement
Inlet and Discharge Apertures to Suit Product

Conveyor

40" Effective Belt Width
Ashworth Omniflex ⅜"-Pitch Belt with Mesh Overlay
F.D.A. Approved

Evaporators

Two Separate Units:	60 kW Thermal Duty at Infeed
	40 kW Thermal Duty at Outfeed
General Construction	Stainless Steel with Aluminum Fins
	Ducted Axial Fans
	Coil and Tray Defrost Heaters

	60 kW Infeed	40 kW Infeed
Air on Temp. ° C.	-17.1	-17.1
Air off Temp. ° C.	-20	-20
Refrigerant	NH^3	NH^3
System	Dx	Dx
Evap. Temp. ° C.	-27	-27
Air Volume m^3/s	16.46	10.97
Face Velocity m/s	3	3
Face Dimensions mm	1524 x 3600	1524 x 2400
Internal Volume dm^3	220	120

Baffles

All Stainless Steel
Designed to Eliminate "Short Circuiting" of Air Flow
Removable for Cleaning

Control Panel

Stainless Steel Enclosure
Control Gear UL/FM Approved
Electronic Variable Speed Controller
Residence Time Indicator in Min./Sec.
Temperature Controller (PID)
Defrost Controls (Hot Gas, if required)
Coil Block and Tray Heater Controls

Belt Washer

25 Bar High Impingement Belt Wash System

UNITHERM Linear Impingement Chiller
Price F.O.B. Ponca City, Oklahoma $185,000

Delivery Lead Time - All of the Above

16 - 20 weeks from receipt of confirmed order and deposit Lead time commences from receipt of deposit and agreement of drawings

Payment Terms on All Items

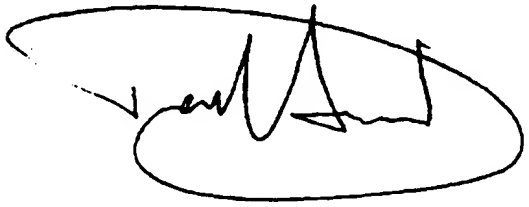
30% Deposit with purchase order
30% Progress payment 4 weeks from placement of order
30% Prior to shipment, upon inspection at UNITHERM
10% Retention due 30 days after completion of installation

Terms and Conditions of Sale

This contract is subject to UNITHERM'S standard terms and conditions of sale printed on the reverse of this quotation's cover sheet.

I trust this quotation will meet with your approval; I look forward to speaking with you soon.

Regards,



David Howard
President

UNITHERM Food Systems, Inc.

Cooking Trial Data

Date: December 30, 1996

Product: Hams

Supplied By: BRYAN FOODS

Test #	Belt Speed	Cook Time	Temperatures C.		Start Weight	Cooked Weight	Yield	Internal Temp. F.	Remark
			Zone 1	Zone 2					
#1		10 min.	350 o C.		7.985	7.8	97.68%		Charsol Supreme 50/50
#2		10 min.	350 o C.		8.695	8.52	97.99%		Zesti Poly 50/50
#3		10 min.	350 o C.		8.325	8.185	98.32%		Zesti Poly 50/50
#4		10 min.	350 o C.		9.755	9.595	98.36%		Zesti Poly 50/50
#5		10 min.	350 o C.		9.83	9.665	98.32%		Zesti Poly 50/50
#6		10 min.	350 o C.		9.175	9.005	98.15%		Charsol Supreme 50/50
#7		10 min.	350 o C.		9.31	9.135	98.12%		Charsol Supreme 50/50
#8		10 min.	350 o C.		7.785	7.61	97.75%		Charsol Supreme 50/50

NOTES

U-05133

PTO-004058

R&D Testing Procedure

Product - All Smoked Products — *Test No. - Revised 7VAT411*

Type of Change - New Process — *Date - Jan. 24, 1997*

New Product or Process Improvement - Reduce labor / improved product

Summary of the Test

Objective:

Unitherm has a new process that they would like Boar's Head to review. This testing will evaluate the new process.

Procedure:

Review the 'current' new product procedure with the new process proposed by Unitherm. Willy Murgolo, Steve Valesko and R Howard will review.
Prepare 6 pieces of Oven Gold in the net as if preparing for Mesquite Smoked Turkey Breast.
Stuff 6 pieces in H/M 7-7 3/4# netting (skin-on) - be careful not to contaminate the product with cure.
After the 'E', place the products in Cooking in bags and follow the current procedure
After chilling the product, place in Cryovac bags and seal and Shrink.
Have product ready for Steve Valesko in a Styrofoam container to take to Oklahoma

Add to Original Test !

Make 6 units of skinless as above procedure BUT use the Honey Maple NET (NO Collagen).
Note: Use Oven Gold cycle to an Internal Temperature of 162 F.

Support Request:

Evaluation of the Test

Test Prepared by - ***Approved by -*** R Howard

CC: Willy Murgolo, Roger Howard, George Marr, Plant Mgrs., Quality Mgr.

R&D Testing Procedure

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Note: Use Oven Gold cycle to an Internal Temperature of 162 F.

Support Request:

Evaluation of the Test

Test Prepared by -

Approved by - R Howard

CC: Willy Murgolo, Roger Howard, George Marr, Plant Mgrs., Quality Mgr.

UNITHERM Food Systems, Inc.

Date: January 27, 1997

Cooking Trial Data

Product: Turkey

Supplied By: FOSTER FARMS

Te t #	Belt Speed	Cook Time	Temperatures C. Zone 1	Temperatures C. Zone 2	Start Weight	Cooked Weight	Yield	Internal Temp. F.	Remarks
#1		15 min.	300 o C.	350/300	7.19	6.80	94.58%	41	Surface temp. 126 1/2 F.
#2		15 min.	300 o C.	350/300	7.92	7.43	93.75%	29.0/43.8	Into second zone 10:39. Surface 138 o.
#3		15 min.	300 o C.	350/300	7.63	7.31	95.81%		Too light
#4		15 min.	300 o C.	350/300	7.07	6.76	95.68%		38 o before cooking - Too light
#5		15 min.	300 o C.	350/300	8.91	8.55	95.96%		Skin on - Too light
#6		15 min.	300 o C.	350/300	7.40	6.97	94.25%		Skinless
#7		15 min.	300 o C.	350/300	9.71	9.11	93.82%		Skin on
#8		15 min.	300 o C.	350/300	8.38	8.00	95.47%		Smoked & cured
#9		15 min.	300 o C.	350/300	7.97	7.69	96.49%		Browned only - Skinless
#10		15 min.	300 o C.	350/300	8.39	7.88	93.98%		Skinless
#11		15 min.	300 o C.	350/300	7.70	7.54	97.92%		Skinless
#12		15 min.	300 o C.	350/300	8.15	7.33	89.94%		Skinless
#13			300 o C.	350/300	7.50	7.24	96.53%		Smoke 50/50 Charsol Supreme - In oven less than 10 min.; oven speeded up to get proper color
#14			300 o C.	350/300	8.08	7.77	96.16%		Smoke 50/50 Charsol Supreme - In oven less than 10 min.; oven speeded up to get proper color

U-03950

NOTE: Crowns did n t hav any dextrose or super ingredients in the deli rolls.

PTO-004061

UNITHERM Food Systems, Inc. | **Date:**

Cooking Trial Data

Product: | **Supplied By:**

Test #	Belt Speed	Cook Time	Temperatures C. Zone 1	Temperatures C. Zone 2	Start Weight	Cooked Weight	Yield	Internal Temp. F.	R marks
#1					8.38	8.00	4.53		Smoked + Cured
#2					7.97	7.61			Browned only skinless
#3					8.385	7.88	4.0		Skin on 7.88
#4					7.70	7.54	5.37 And		Skinless
#5				230	8.15	7.33	225		"
#6		Low temp			7.5	7.24	7.4		Smoke 50/50 Chicken Sausage
NOTES		Low temp			8.08	7.77	7.8		Smoke 50/50.

#1 Oven opened by mistake

#2

#3

#4

#5

#6

U-03951

PTO-004062

UNITHERM Food Systems, Inc.

Date:

Cooking Trial Data

Product:

Supplied By:

Test #	Belt Speed	Cook Time	Temperatures C. Zone 1	Temperatures C. Zone 2	Start Weight	Cooked Weight	Yield	Internal Temp. F.	Remark
#1		15 min.	300°	350° 300°	7.190	6.8	5.4%	41	SURFACE TEMP 126 1/2 F IN-TEMP 41
#2			[illegible]	350 300	7.02	7.425	6.1%	START 31.0 45.8°	start second zone 10:37 [illegible] 128°
#3					7.630	7.310	4.2%		
#4					7.085	6.76	4.3		38° in/ cooking Too light
#5					8.91	8.55	4.04		Too light
#6					7.395	6.970			

NOTES

#1

#2

#3 CROWNS

#4 * NOTE- ~~Product~~ did not have any dextrose or sugar ~~products~~ in the end deli rolls.

#5

#6

U-03952

PTO-004063